Claims

1. An air duct having a thermal solar absorber formed on one (upper) surface of said duct and in thermal communication with the interior of the duct, said absorber having a transparent pane through which said duct upper surface can be illuminated by solar radiation with a stagnant atmosphere between said pane and said duct upper surface, wherein said pane and said duct upper surface are substantially co-extensive, said duct has at least one inlet and at least one outlet, the periphery of said pane substantially overlies said inlet(s) and outlet(s), and the intended flow of air through said duct below said pane is substantially unidirectional.

2. The duct as claimed in claim 1 and having connection means to permit said duct to be connected either in series, or in parallel, or both, with like ducts.

3. The duct as claimed in claim 2 and having a transverse cross-sectional shape which is a trapezium.

4. The duct as claimed in claim 3 wherein said transverse cross-sectional shape is a parallelogram.

5. The duct as claimed in claim 4 wherein said connection means includes fasteners having a substantially vertically extending shank which, when tightened, exert a horizontally extending force component on said inlet or outlet.

6. The duct as claimed in any one of claims 1-5 and including an air/liquid heat exchanger in thermal communication with the duct interior.

7. The duct as claimed in claim 6 wherein said air/liquid heat exchanger comprises a thermally conductive pipe passing through said duct interior.

8. The duct as claimed in claim 6 or 7 wherein said liquid is water.

9. A modular set of a plurality of air ducts each being as claimed in claim 2.

10. The set as claimed in claim 9 wherein each said duct is shaped to mate with like ducts to thereby form an array.

11. A solar energy system for a building having an exterior surface exposed to solar radiation, said system comprising,

a plurality of air ducts as claimed in claim 2 and being mounted on said exterior surface to receive said solar radiation, and

an air/liquid heat exchanger in thermal communication with at least one duct interior and connected with at least one heat absorbing load.

12. The system as claimed in claim 11 wherein said air ducts are connected in an air flow path which includes at least one hot air outlet located in the interior of said building.

13. The system as claimed in claim 12 wherein said air flow path includes a heat bank.

14. The system as claimed in claim 13 wherein said air flow path includes an external heat source.

15. The system as claimed in claim 14 wherein said external heat source is connected with said heat bank.

16. The system as claimed in claim 15 wherein said external heat source is selected from the group consisting of a fuel burning heater, an electric heater, and a reverse cycle air conditioner.

17. The system as claimed in any one of claims 11-16 wherein said heat absorbing load comprises a hot water service.

18. The system as claimed in any one of claims 11-17 wherein at least one of said air ducts is modified to replace the thermal solar absorber thereof with a photovoltaic collector.

19. A method of sealing adjacent air ducts in an array of air ducts forming a thermal solar collector, said method comprising carrying out, not necessarily in sequence, the steps of:

(i) inclining to a substantially like extent at least one pair of adjacent side walls of at least one pair of said ducts,

(ii) locating an opening in each said adjacent side wall,

(iii) aligning said openings,

(iv) interposing between said adjacent side walls a strip of resilient material which extends in a loop around the periphery of each said opening, and

(v) moving one of said pair of ducts vertically with respect to the other of said pair of ducts to thereby generate a compressive horizontal component force which compresses said strip to thereby seal said openings.

20. The method as claimed in claim 19 comprising the further step of:

(vi) fixing said other duct and moving said one duct relative to said fixed duct.

21. The method as claimed in claim 19 or 20 comprising the further step of:

(vii) inclining all sides of all said ducts to said substantially like extent to permit openings extending in the row direction, or the column direction, of said array to be sealed.

22. A method of joining cells in an array of solar thermal absorber cells in a water shedding arrangement on an inclined roof, said method comprising the steps of:

(i) forming each said cell with a transparent upper surface which is substantially co-extensive with said cell,

(ii) forming an overlap portion at one longitudinal edge of each said cell,

(iii) arranging said cells in columns and rows to form said array on said inclined roof with said one longitudinal edge lowermost, and

(iv) overlapping said one longitudinal edge of each cell with the opposite longitudinal edge of the longitudinally adjacent cell.

23. The method as claimed in claim 22 including the step of:

(v) forming a rebate in said lowermost longitudinal edge to receive therein the opposite longitudinal edge of the adjacent cell.